

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Masanori NAKAMUURA et al. Group Art Unit: To Be Assigned

Application No.: New application Examiner: To Be Assigned

Filed: December 7, 2001 Attorney Dkt. No.: 103120-00028

For: A PLANT FOR PRODUCING A METAL BAND WITH PROTECTION COATING

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Date: December 7, 2001

Sir:

Prior to initial examination of the application, please amend the above-identified application as follows (a marked-up version is attached hereto):

IN THE SPECIFICATION:

Please replace the paragraph on page 10, beginning at line 5 with the following paragraph:

It appears therefore that the band runs in each coating section, respectively metal B and application C, while following a running path comprising at least two vertical branches connected by a horizontal branch. Each coating section B, C is therefore inscribed in a rectangular block having two vertical lateral sides perpendicular to the general horizontal running direction of the band and whose height depends on the time necessary, on the one hand to the solidification of the zinc and, on the other hand, to the drying of the paint, taking into account the running speed. When two coats of paint are necessary, it is possible, as indicated above, to reduce the height of the section while folding the running path into two parallel columns.

IN THE CLAIMS:

Please cancel 1-23 without prejudice or disclaimer:

Please add new claims 24-50 as follows:

-- 24. A plant for producing a metal band coated with at least one protection layer comprising means for controlling the running of the band M, successively, through a series of treatment sections, placed one after the other in a continuous line, and comprising at least, in one running direction of the band:

 a supply section A,

 a first metal coating section B with two lateral sides perpendicular to a longitudinal running direction of the band M, respectively a first side B1 and a second side B2, and comprising a means for feeding the band into the metal coating section B, located at a low level of the first side B1 thereof and ending in a tub fillable with a liquid metal bath, means for guiding the band along a first running path comprising an immersion section penetrating into the tub for depositing metal on the band M, a rising section extending along a substantially vertical direction between an exit from the tub and a first high level and a falling section extending between the first high level and a first exit means from the first coating section B, located at a first low level on the second side B2 thereof, cooling means being arranged at least along the rising section of the first running path for solidification of the metal deposited on the band M,

 a second application coating section C, located beside the first section B and having two sides spaced apart perpendicular to the running direction, respectively a first side C1 extending along the second side B2 of the metal coating section B and a second side C2, wherein the second coating section C comprises second means for coating the band M that are placed at a second low level of the first side C1, means for guiding the band along a second running path passing in front of the second coating means and comprising at least one rising section extending vertically between the low level of the second coating section C and a second high level, along which are placed means for drying the coating after application, and a second exit means from the second coating section C, placed on the second side C2 thereof, and

an exit section D receiving the band from the second exit means and comprising at least one band accumulator and winding means .

25. A plant according to claim 24, further comprising a complementary treatment section placed on the path of the band M between the first exit means of the first metal coating section B and an inlet of the second application-coating section C.

26. A plant according to claim 25, characterized in that the complementary treatment section comprises a skin-pass mill placed between two tensioners .

27. A plant according to claim 26, characterized in that the complementary treatment section comprises a planer under load placed between the two tensioners .

28. A plant according to one of the claims 25 to 27, characterized in that the complementary treatment section comprises an additional coating device.

29. A plant according to claim 28, characterized in that the additional coating device includes a chromating device.

30. A plant according to claim 28, characterized in that the additional coating device includes a phosphating device.

31. A plant according to claim 24, further comprising an inlet means for entering the second application coating section C placed on the second side C2 thereof, opposite to the first coating section B and wherein, between the exit means of the first coating section B and the inlet means into the second coating section C, the band follows a bent linking path comprising at least a first horizontal branch passing, at low level, beneath the second coating section C, a means for reversing direction of the linking path, and a second horizontal branch returning, at middle level, to the inlet means into the second coating section C.

32. A plant according to claim 31, characterized in that it comprises a complementary treatment section placed in the extension of the first branch of the linking path and that the second branch returning to the inlet means in the second coating section C passes above the complementary treatment section .

33. A plant according to claim 32, characterized in the exit section D comprises an exit accumulator of horizontal type and that the complementary treatment section and the branch returning to the second coating section C are placed beneath at least one rear portion of the exit accumulator .

34. A plant according to claim 24, characterized in that the second running path in the application coating section C is folded into two nested columns comprising successively, from a low level of the coating section C, a first rising path comprising first coating and drying means, a first means for reversing direction of the second running path, a falling path to a second means for reversing direction of the second running path, a second rising path comprising second coating and drying means, and a return path returning to the front to the second exit means from the application coating section C, placed on the second side C2 thereof, above the inlet means.

35. A plant according to claim 24, characterized in that the exit section D comprises successively, in the running direction of the band M, the at least one band accumulator which comprises an exit accumulator of horizontal type, means for reversing direction of the running path, and the winding means which are placed beneath a front portion of the exit accumulator.

36. A plant according to claim 35, further comprising means for inspecting the band that are placed between the means for reversing direction of the second running path, said means for reversing direction of the second running path including two rolls to the rear of the band and wherein the exit accumulator is sized to enable band stoppages for inspection purposes.

37. A plant according to one of the claims 24, 25, 31, 34, or 35, further comprising means for selectively putting into service pieces of equipment in each treatment section thereby enabling choosing an operating mode suited to the needs among a set of combination possibilities of the pieces of equipment.

38. A plant according to claim 36, characterized in that the means for selectively putting into service pieces of equipment in each treatment section enables choosing an operating mode suited to the needs among a set of possibilities comprising at least a first mode with only metal coating, a second mode with metal coating and complementary treatment, a third mode with complementary treatment and application coating, a fourth mode with both metal coating and application coating, and a fifth mode with only application coating.

39. A plant according to claim 38, wherein each operating mode further comprises a complementary treatment with at least one 'skin-pass'.

40. A plant according to claim 24, characterized in that the exit accumulator comprises a plurality of parallel belts traveling back and forth along paths predetermined by a set of fixed rolls and a set of mobile rolls placed on a looping-in carriage movable between two positions which are a minimum accumulation retracted position and a maximum accumulation extended position, and intermediate sets of separating arms spaced apart and distributed over the length of the accumulator in order to come between the parallel belts of the band, wherein each set of separating arms is connected to means for controlling respectively the engagement and the disengagement of the arms, as the looping-in carriage moves respectively in an increasing direction or in a reduction direction of an accumulated length of the band.

41. A plant according to claim 40, characterized in that a rear portion of the exit accumulator, comprised between a middle position of the looping-in carriage and the minimum accumulation retracted position, does not contain any separating arms and in that tensioners are placed, respectively upstream and downstream of the exit

accumulator in order to maintain sufficient traction on the band M to prevent any contact between the belts, in said rear portion.

42. A plant according to claim 24, characterized in that the band is brought to a temperature at least equal to that of the liquid metal contained in the tub.

43. A plant according to claim 42, characterized in that the supply section A comprises means for unwinding reels, an inlet accumulator and means for pre-heating the band.

44. A plant according to claim 43, characterized in that the means for pre-heating the band comprises an annealing furnace and means for cooling the band M to a temperature compatible with the metal coating.

45. A plant according to one of the claims 24, 25, 31, 34, 35, or 40, characterized in that said plant further comprises a single building comprising a central tower with two abutting sections in which are provided both the metal coating section B and the application coating section C, and two halls of smaller height than said central tower that extend respectively on either side of said central tower and in which are installed, respectively, the exit section D and the supply section A.

46. A plant according to claim 45, further comprising means for selectively putting into service pieces of equipment in each treatment section thereby enabling choosing an operating mode suited to the needs among a set of combination possibilities of the pieces of equipment.

47. A plant according to claim 46, characterized in that the means for selectively putting into service pieces of equipment in each treatment section enables choosing an operating mode suited to the needs among a set of possibilities comprising at least a first mode with only metal coating, a second mode with metal coating and complementary treatment, a third mode with complementary treatment and application

coating, a fourth mode with both metal coating and application coating, and a fifth mode with only application coating.

48. A plant according to claim 45, characterized in that the hall having the exit section D has a height and a length corresponding at least to a height and to a length of the exit accumulator.

49. A plant according to claim 48, characterized in that the hall having the exit section D exhibits a height determined in order to cover the exit accumulator while leaving beneath the accumulator a space of sufficient height to contain a complementary treatment section of the band extending beneath a rear portion of the accumulator, and at least said means for winding the band extending beneath a front portion of the accumulator, wherein the length of the hall is determined in order to leave, ahead of the accumulator, sufficient room to place therein the means for reversing the running direction of the band M.

50. A plant according to claim 48, characterized in that the hall having the supply section A has a height and a length corresponding at least to a height and to a length of an inlet accumulator.

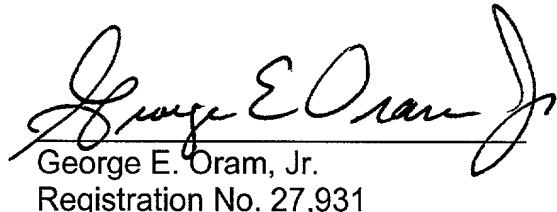
51. A plant according to claim 50, characterized in that the hall having the supply section A exhibits a height determined in order to cover the assembly composed of the inlet accumulator and a means for pre-heating the band. --

REMARKS

Claims 24-51 are pending in this application. Claims 1 - 23 are being canceled. By this Amendment, claims 24-51 are amended to correct the multiple dependency of the original claims and to place this application into better condition for examination. No new matter is contained in the amendments.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300.

Respectfully submitted,



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MARKED-UP COPY OF AMENDED PARAGRAPH

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It appears therefore that the band runs in each coating section, respectively metal "C" --B-- and application C, while following a running path comprising at least two vertical branches connected by a horizontal branch. Each coating section B, C is therefore inscribed in a rectangular block having two vertical lateral sides perpendicular to the general horizontal running direction of the band and whose height depends on the time necessary, on the one hand to the solidification of the zinc and, on the other hand, to the drying of the paint, taking into account the running speed. When two coats of paint are necessary, it is possible, as indicated above, to reduce the height of the section while folding the running path into two parallel columns.